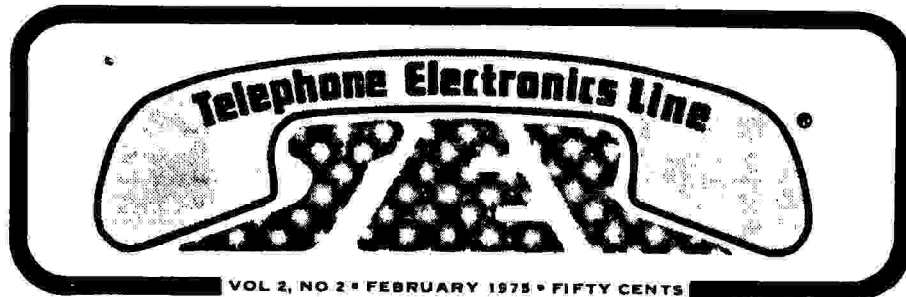


// LEARN WHAT THOSE LITTLE  
CODE NUMBERS AT THE TOP OF  
YOUR TELEPHONE BILL MEAN  
TO YOU.

// HOW ARE YOU SO SURE THAT  
YOU WILL GET A DIAL TONE  
EVERY TIME YOU PICK UP THE  
TELEPHONE HANDSET?



Isn't it a pity  
when no one's at home...  
...in such a large city  
to answer their phone-



Telephone Electronics Line



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# The Old TEL

We continue to grow with your support. In fact, we'll be expanding in volume 25% by next issue. In addition, you will enjoy following the multi-color diagrams, and larger cleaner type. We ask that you become an agent for TEL and sell a subscription to someone you know!



If it's TEL, it's swell!

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

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Telephone Electronics Line

# TAD TELEPHONE ANSWERING/RECORDING DEVICES

BY FRED BLECHMAN

This is a fast world we're in today, and the telephone is an essential part of business and social life. A missed call can cause a small businessman to lose a large order. A housewife could miss a social appointment change. A salesman could miss contact with an important prospect. A professional could lose a client.

The Telephone Answering Device (TAD) answers your phone when it rings and let's the caller hear your programmed message. Just as the caller hears YOUR voice, you hear HIS. You receive the message he leaves, first hand, and can judge his frame of mind as accurately as if you were actually talking with him. You hear ALL he says, and exactly WHAT he says, with no third person involved.

Small businessmen, salesmen, professional men, busy housewives and scores of others depend on the telephone. The TAD fills in when you step out by automatically taking the messages, orders or appointments that would otherwise be missed. For the small businessman, the TAD may save the expense of secretarial help or prevent loss of business and prestige when the telephone goes unanswered. Calls from salesmen, distributors or customers can be answered automatically, and accurately, any time of the day or night.

For the professional, reliable and accurate messages mean good relations with patients or clients and proper handling of emergency situations. Executives, when in conference or absent from their desk, can advise the caller of later availability. Salesmen can accept orders when out "prospecting". Housewives can route important calls to a neighbors phone or check messages and return calls immediately after shopping or dropping off the children at school.

Young people can schedule social appointments without waiting at home for a call. In short, a TAD can be an asset to anyone who has a telephone - 24 hours a day, 7 days a week, without complaint, vacation, coffee breaks, or errors!

## ANSWERING SERVICES

"Yeah", you say, "but how about a Telephone Answering Service?" An Answering SERVICE is an operator who takes messages and repeats it to you when you call back. The problems with this, however, are the "human" element. The message repeated back to you can be incomplete or incorrect - it's amazing how much can get lost in the "translation"! Also, a busy operator keeps the caller or subscriber waiting while she handles other calls at her switchboard. And, who wants to leave a personal or complicated message with an operator? The TAD repeats the EXACT message, with the voice and emphasis of the caller. Not only that, but a TAD will usually pay for itself within a year as compared to the monthly cost of an Answering Service.

## COMPARISON CHART

Okay, let's say that now you're convinced you can't live any longer without a Telephone Answering Device. How do you find out about them? Where can you get them, and how much do they cost? What are some of the features that are really worth something, and what "features" are just "window dressing"? Well, to solve your dilemma, we've provided an in-depth Comparison

Page 3

February 1975

Chart that shows the details of 25 units.....and to help you understand the chart, we're going to discuss each column briefly:

#### COLUMN 1

**Manufacturer or Distributor:** Write here for more information, and the location of your local distributor. For any unit selling above \$250, you should ask for a demonstration. On less expensive units the profit is often too low to allow direct selling, so they are usually sold by mail, with a guarantee of satisfaction.

#### COLUMN 2

**Model Name & Number:** Sometimes you'll find identical machines under different names. For example, the Ansaphone 540 (no longer available from Dictaphone, except from existing inventories) has shown up more recently (with improvements) as the Sanyo Answer Man and the Code-A-Phone Model 360. Also, model changes occur frequently; since the Chart was drawn up, Phone-Mate 400 to a Phone-Mate 400s, with a switch to disable the monitor, an improvement at no extra cost. So watch for model changes.

#### COLUMN 3

**Suggested Retail Price:** The prices shown are those furnished by the sources listed. However, prices vary around the country, especially on the higher-priced units, where there may be some room for bargaining with the salesman - he may be willing to give up some of his commission to make the sale on the spot.

#### COLUMN 4

**Maximum Outgoing Message:** This could be very important to you. Under normal conditions of use, 18-30 seconds is plenty of time for you to tell the caller, in your voice and words, that you are not in, and to leave a message. But you may want this unit to give a sales pitch, recite your business hours, give a message-of-the-day, redirect calls to where you'll be at certain times,

announce a schedule or menu, or any of a thousand uses that might take several minutes.

#### COLUMN 5

**Variable Length Outgoing Message:** Here, again, it depends on your intended use. A fixed outgoing message time is usually fine; but variable length gives you a lot more flexibility. With variable length your incoming message can start immediately at the end of your outgoing message, as long as it may be.

#### COLUMN 6

**Maximum Incoming Message:** If all you expect to receive is a name, phone number and short message, 24 - 30 seconds is good enough. But if you expect detailed information, long orders, dictation, field reports, etc., then look for a longer incoming message.

#### COLUMN 7

**Maximum Messages:** This may confuse you but, it's based on the most messages of the shortest length. For machines that shut-off automatically after a person hangs up (see col. 8) we've used 30 seconds as the average message length, incoming. **NOTE:** Columns 5, 6, & 7 reflect manufacturer's data, which change with technology. Those machines using standard cassettes (Footnotes A&H) may have longer capability than specified if C-120 or C-180 cassettes are used. Figures shown are based on C-90 cassettes.

#### COLUMN 8

**Voice Activated:** This feature provides automatic shut-off about 12 seconds after caller stops speaking or hangs up. It allows the incoming caller to leave his whole message, instead of perhaps cutting him off, as the fixed-time units might. This might be very essential for your use.

#### COLUMN 9

**Automatic Level Control:** This boosts the volume on a soft-spoken caller, or bad connection, and cuts the volume down when it's too

Telephone Electronics Line

strong. This is certainly a desirable feature, especially since some people are scared to death of talking to a machine, and either hang up or speak very low. Improves outgoing messages, too.

#### COLUMN 10

**Call Received Indicator:** When you return, after leaving your TAD to answer the phone, you'd like to know if there are any messages. Without some form of call indicator, all you can do is rewind the tape and play it back. With some type of indicators (light or flag), you can only tell that at least one message has been recorded, but you can't tell how many. With a tape counter, there are a certain number of digits the counter moves for each message, so you can tell the number of calls received, and you can "fast forward" to the next call on hang-ups. A call counter, of course, counts the number of calls received. The Code-A-Phone indicator is described as "an elapsed time indicator that shows the volume of calls recorded", whatever that means (probably a tape counter).

#### COLUMN 11

**Records Phone Conversations:** While some of the units can be gimmicked up to record both sides of a telephone conversation, the Chart only indicates those where the manufacturer's literature show this as a feature. In some units, a beep-tone every 15 seconds or so alerts the caller that he's being recorded, to conform to FCC regulations. This recording feature can be mighty handy for technical and legal discussions that get confused and involved. In most cases the monitor also allows group listening in this mode of operation, which lends itself to great training for telephone solicitors - everyone listens, and then the tape is played back for discussion in a training class.

#### COLUMN 12

**Remote Call-Back:** Found only on

the more expensive machines, this feature allows you to call into your TAD from any telephone in the world and hear any messages. You may also, with some units, change your outgoing message remotely. This is a luxury feature, but might be necessary for YOU.

#### COLUMN 13

**Dimensions:** "Wide" is across the front of the unit, "Deep" is the distance from front to back, and "High" is top to bottom. If desk space is an important factor, a narrow, deep unit may be best.

#### COLUMN 14

**Features and Remarks:** There are many features common to all the units shown, except as noted. They all record incoming messages, monitor through a speaker or earphone, have a silencing switch to "kill" the monitor when you want real silence, operate on regular 117 volts AC, plug directly into the phone jack (more on that further on), have variable incoming message length, and have fast-forward and fast-rewind controls. The footnotes cover other features, and are mostly self-explanatory. Note F refers to a special feature of the Phone Butler which allows it to be used as an "electronic bulletin board" for anyone in the family to leave a message for another family member on the tape.

#### OTHER QUESTIONS?

That pretty well takes care of explaining the Chart. But here are the answers to some other typical questions that might be in your mind: *What about service and guarantees?* Well, since there are many units now being offered by mail, you can always send those back for service. Keep the shipping cartons. Units purchased locally usually have a service center. It's a good idea to deal with an established firm; if in doubt check with Better Business Bureau

(continued on page 12)







a busy. Also a comment: since this number gives back a dial tone, it seems to have great potential, but I have never found other uses for it.

Suggestion 1. A fascinating project for the beginner in telephone experimenting is to make a list of unlisted exchanges. Use your directory to eliminate the admitted exchanges in your area, then dial the others, followed by a four digit dummy number like -1212. Depending on the equipment in your exchange, you will note a pattern to the responses. For example some exchanges you dial may give a busy signal, while others give a recording of a message. I have found that at least here in the east is the information exchange for the old DINA network, now sold to Telcel.

Suggestion 2. Do the same experiment with area codes. You will probably find 1 or 2 "unlisted" codes in your area, including 903 (Mexico).

Suggestion 3. Collect a list of office (Exchange) codes from around the country, and look for missing codes. There should be interesting stuff here although my discoveries have been meager. I have long suspected that there is a nationwide means to dial toll-free, set up by using unlisted exchanges, but I have never found it.

And, finally, a personal note. I would like to obtain Vol 1, #7 of your magazine. Please advise if this is available.

Yours truly,  
Paul Carlson  
108 Allison Road  
Pittsburgh, Pa.



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addition, information calls never drop supervision legitimately but if you use any information call to access long lines, then make another call you will drop supervision, and that is most suspicious.

Now here, for the general welfare, are a few suggestions and numbers. First, the numbers in the 412 (Western Pennsylvania) Area.

1000 Hz test tone in very old exchanges. In ESS exchanges such as 391, last starts with several bursts of 2400 Hz. Then goes to busy.

XIX-0062 Gives overflow signal in most exchanges.

XIX-0068 1000 Hz Test Tone in Most Exchanges.

XIX-0085 Rev. Batt. Test in Most Exchanges.

XIX-0092 Loop Arounds

XIX-0093 Permanent Busy

XIX-0096 An unusual tone. I don't know what this is and would appreciate your suggestions. This number is non-supervising.

391-8999 Rings back when you hang up. To use this number, suppose you are calling from 396-9101. Dial 985-9101, wait for dial tone, then dial 6 and hang up. NOTE: The 985 number is different in other area codes. In 312, it is 571. Also, some older equipment gives dial tone after dialing only 985 (not 985-9101) and using this number, if you dial some other four digits than 985, you get a busy.

I recently came across the following information. To make a free call from any place in the world it is necessary to dial a 10 digit number. This number is a TOUCH-TONE line and a 2600 Hz tone. Simply dial any "800" MANS number. Then, after you have finished dialing and before the call goes through, inject the tone-it need not even be hooked into the line, just play it into the mouthpiece. This will clear the line. Then, just dial the number you wish to call. This method is particularly good since it is undetectable and neither you nor the holder of the MANS line gets billed.

I find your magazine quite good but would appreciate more construction plans and possibly a classified ads department where readers could exchange ideas and equipment. Keep up the good work.

S. H.  
Kamaroneck, NY

## Letters

From the reader

and a 7-digit number preceded by a KP (Key Pulse) and followed by a STS (Start). These frequencies consist of the following: 700 Hz, 900 Hz, 1100 Hz, 1300 Hz, 1500 Hz, and 1700 Hz. TOUCH-TONE frequencies are: 200 Hz, 220 Hz, 240 Hz, 260 Hz, 280 Hz, 300 Hz, 320 Hz, 340 Hz, 360 Hz, 380 Hz, 400 Hz, 420 Hz, 440 Hz, 460 Hz, 480 Hz, 500 Hz, 520 Hz, 540 Hz, 560 Hz, 580 Hz, 600 Hz, 620 Hz, 640 Hz, 660 Hz, 680 Hz, 700 Hz, 720 Hz, 740 Hz, 760 Hz, 780 Hz, 800 Hz, 820 Hz, 840 Hz, 860 Hz, 880 Hz, 900 Hz, 920 Hz, 940 Hz, 960 Hz, 980 Hz, 1000 Hz, 1020 Hz, 1040 Hz, 1060 Hz, 1080 Hz, 1100 Hz, 1120 Hz, 1140 Hz, 1160 Hz, 1180 Hz, 1200 Hz, 1220 Hz, 1240 Hz, 1260 Hz, 1280 Hz, 1300 Hz, 1320 Hz, 1340 Hz, 1360 Hz, 1380 Hz, 1400 Hz, 1420 Hz, 1440 Hz, 1460 Hz, 1480 Hz, 1500 Hz, 1520 Hz, 1540 Hz, 1560 Hz, 1580 Hz, 1600 Hz, 1620 Hz, 1640 Hz, 1660 Hz, 1680 Hz, 1700 Hz, 1720 Hz, 1740 Hz, 1760 Hz, 1780 Hz, 1800 Hz, 1820 Hz, 1840 Hz, 1860 Hz, 1880 Hz, 1900 Hz, 1920 Hz, 1940 Hz, 1960 Hz, 1980 Hz, 2000 Hz, 2020 Hz, 2040 Hz, 2060 Hz, 2080 Hz, 2100 Hz, 2120 Hz, 2140 Hz, 2160 Hz, 2180 Hz, 2200 Hz, 2220 Hz, 2240 Hz, 2260 Hz, 2280 Hz, 2300 Hz, 2320 Hz, 2340 Hz, 2360 Hz, 2380 Hz, 2400 Hz, 2420 Hz, 2440 Hz, 2460 Hz, 2480 Hz, 2500 Hz, 2520 Hz, 2540 Hz, 2560 Hz, 2580 Hz, 2600 Hz, 2620 Hz, 2640 Hz, 2660 Hz, 2680 Hz, 2700 Hz, 2720 Hz, 2740 Hz, 2760 Hz, 2780 Hz, 2800 Hz, 2820 Hz, 2840 Hz, 2860 Hz, 2880 Hz, 2900 Hz, 2920 Hz, 2940 Hz, 2960 Hz, 2980 Hz, 3000 Hz, 3020 Hz, 3040 Hz, 3060 Hz, 3080 Hz, 3100 Hz, 3120 Hz, 3140 Hz, 3160 Hz, 3180 Hz, 3200 Hz, 3220 Hz, 3240 Hz, 3260 Hz, 3280 Hz, 3300 Hz, 3320 Hz, 3340 Hz, 3360 Hz, 3380 Hz, 3400 Hz, 3420 Hz, 3440 Hz, 3460 Hz, 3480 Hz, 3500 Hz, 3520 Hz, 3540 Hz, 3560 Hz, 3580 Hz, 3600 Hz, 3620 Hz, 3640 Hz, 3660 Hz, 3680 Hz, 3700 Hz, 3720 Hz, 3740 Hz, 3760 Hz, 3780 Hz, 3800 Hz, 3820 Hz, 3840 Hz, 3860 Hz, 3880 Hz, 3900 Hz, 3920 Hz, 3940 Hz, 3960 Hz, 3980 Hz, 4000 Hz, 4020 Hz, 4040 Hz, 4060 Hz, 4080 Hz, 4100 Hz, 4120 Hz, 4140 Hz, 4160 Hz, 4180 Hz, 4200 Hz, 4220 Hz, 4240 Hz, 4260 Hz, 4280 Hz, 4300 Hz, 4320 Hz, 4340 Hz, 4360 Hz, 4380 Hz, 4400 Hz, 4420 Hz, 4440 Hz, 4460 Hz, 4480 Hz, 4500 Hz, 4520 Hz, 4540 Hz, 4560 Hz, 4580 Hz, 4600 Hz, 4620 Hz, 4640 Hz, 4660 Hz, 4680 Hz, 4700 Hz, 4720 Hz, 4740 Hz, 4760 Hz, 4780 Hz, 4800 Hz, 4820 Hz, 4840 Hz, 4860 Hz, 4880 Hz, 4900 Hz, 4920 Hz, 4940 Hz, 4960 Hz, 4980 Hz, 5000 Hz, 5020 Hz, 5040 Hz, 5060 Hz, 5080 Hz, 5100 Hz, 5120 Hz, 5140 Hz, 5160 Hz, 5180 Hz, 5200 Hz, 5220 Hz, 5240 Hz, 5260 Hz, 5280 Hz, 5300 Hz, 5320 Hz, 5340 Hz, 5360 Hz, 5380 Hz, 5400 Hz, 5420 Hz, 5440 Hz, 5460 Hz, 5480 Hz, 5500 Hz, 5520 Hz, 5540 Hz, 5560 Hz, 5580 Hz, 5600 Hz, 5620 Hz, 5640 Hz, 5660 Hz, 5680 Hz, 5700 Hz, 5720 Hz, 5740 Hz, 5760 Hz, 5780 Hz, 5800 Hz, 5820 Hz, 5840 Hz, 5860 Hz, 5880 Hz, 5900 Hz, 5920 Hz, 5940 Hz, 5960 Hz, 5980 Hz, 6000 Hz, 6020 Hz, 6040 Hz, 6060 Hz, 6080 Hz, 6100 Hz, 6120 Hz, 6140 Hz, 6160 Hz, 6180 Hz, 6200 Hz, 6220 Hz, 6240 Hz, 6260 Hz, 6280 Hz, 6300 Hz, 6320 Hz, 6340 Hz, 6360 Hz, 6380 Hz, 6400 Hz, 6420 Hz, 6440 Hz, 6460 Hz, 6480 Hz, 6500 Hz, 6520 Hz, 6540 Hz, 6560 Hz, 6580 Hz, 6600 Hz, 6620 Hz, 6640 Hz, 6660 Hz, 6680 Hz, 6700 Hz, 6720 Hz, 6740 Hz, 6760 Hz, 6780 Hz, 6800 Hz, 6820 Hz, 6840 Hz, 6860 Hz, 6880 Hz, 6900 Hz, 6920 Hz, 6940 Hz, 6960 Hz, 6980 Hz, 7000 Hz, 7020 Hz, 7040 Hz, 7060 Hz, 7080 Hz, 7100 Hz, 7120 Hz, 7140 Hz, 7160 Hz, 7180 Hz, 7200 Hz, 7220 Hz, 7240 Hz, 7260 Hz, 7280 Hz, 7300 Hz, 7320 Hz, 7340 Hz, 7360 Hz, 7380 Hz, 7400 Hz, 7420 Hz, 7440 Hz, 7460 Hz, 7480 Hz, 7500 Hz, 7520 Hz, 7540 Hz, 7560 Hz, 7580 Hz, 7600 Hz, 7620 Hz, 7640 Hz, 7660 Hz, 7680 Hz, 7700 Hz, 7720 Hz, 7740 Hz, 7760 Hz, 7780 Hz, 7800 Hz, 7820 Hz, 7840 Hz, 7860 Hz, 7880 Hz, 7900 Hz, 7920 Hz, 7940 Hz, 7960 Hz, 7980 Hz, 8000 Hz, 8020 Hz, 8040 Hz, 8060 Hz, 8080 Hz, 8100 Hz, 8120 Hz, 8140 Hz, 8160 Hz, 8180 Hz, 8200 Hz, 8220 Hz, 8240 Hz, 8260 Hz, 8280 Hz, 8300 Hz, 8320 Hz, 8340 Hz, 8360 Hz, 8380 Hz, 8400 Hz, 8420 Hz, 8440 Hz, 8460 Hz, 8480 Hz, 8500 Hz, 8520 Hz, 8540 Hz, 8560 Hz, 8580 Hz, 8600 Hz, 8620 Hz, 8640 Hz, 8660 Hz, 8680 Hz, 8700 Hz, 8720 Hz, 8740 Hz, 8760 Hz, 8780 Hz, 8800 Hz, 8820 Hz, 8840 Hz, 8860 Hz, 8880 Hz, 8900 Hz, 8920 Hz, 8940 Hz, 8960 Hz, 8980 Hz, 9000 Hz, 9020 Hz, 9040 Hz, 9060 Hz, 9080 Hz, 9100 Hz, 9120 Hz, 9140 Hz, 9160 Hz, 9180 Hz, 9200 Hz, 9220 Hz, 9240 Hz, 9260 Hz, 9280 Hz, 9300 Hz, 9320 Hz, 9340 Hz, 9360 Hz, 9380 Hz, 9400 Hz, 9420 Hz, 9440 Hz, 9460 Hz, 9480 Hz, 9500 Hz, 9520 Hz, 9540 Hz, 9560 Hz, 9580 Hz, 9600 Hz, 9620 Hz, 9640 Hz, 9660 Hz, 9680 Hz, 9700 Hz, 9720 Hz, 9740 Hz, 9760 Hz, 9780 Hz, 9800 Hz, 9820 Hz, 9840 Hz, 9860 Hz, 9880 Hz, 9900 Hz, 9920 Hz, 9940 Hz, 9960 Hz, 9980 Hz, 10000 Hz.

Dear Tel,

I have just received and read your issue. I was very interested in the article on the "Blue Box" and the "Red Box". I am sure that you have the guts to publish the truth and the business sense of the word.

My interest in your publication is based in my own background in telephone technology. I have been in the telephone business for over 20 years. I have been a telephone billing, and finally, and unofficially, a telephone office. From scant information I picked up there, basically about the use of 2600 Hz supervisory tone, and by listening to my own phone, I constructed a "Blue Box" which was fun-but not for long. Telco Security had my number, so to speak, in about a month. I got off rather easily because at the time, ten years ago, there were no specific laws regarding transmitting the signalling. (Laws were passed right after, and because of, this incident.)

The unhappy ending of my career as phone freak - the term wasn't invented yet - brings me to a note of caution that I would like to extend to present day yet-it is this:

If you want to Blue Box it, don't ever access long lines by calling information, or 800 or 900 numbers. This is the surest way to be caught, especially if you consistently call from the same phone.

I would suggest trying call diverters or other local numbers that will not be discernable on your phone's billing records. The trouble with information calls and 800 or 900 calls is they appear on your billing record - but not the bill you receive - and hours of calls to this type of number raises suspicions. In

## Coming Next Month

### HOW THE TELEPHONE WORKS

### OVERSEAS DIALING TECHNIQUES

### PAY PHONE SPECIAL

### C. O. OPERATIONS

### IRS SYSTEM

### LABORATORY SYNTHESIS OF DMT & DET

Dear Sirs:

Many thanks for the December issue of TEL, kind of reminds me of a TAP made respectable - whatever, more power to you! It seems I was missed for the November issue, Vol. 1 No. 1, and I do wish to have a "complete" collection.

Things are taking shape up here, two or three busts by Telco plus FBI and some interesting news is developing out of some of it. It seems that now with the so-called "disclosure" laws permitting the defendant to view before trial all the evidence to be presented against him, Ma Bell may be caught with her drawers down - an important decision may soon be reached with regards to invasion of privacy by Telco employees. Others come forward with a volume of additional evidence to support the claim of illegal invasion of privacy. Contrary to the many press articles appearing across the country in recent weeks, the phone companies do not have a legal right to use their powerful position as a surveillance tool without court order. Local radio and television news services are taking an interest in this, too - the next few weeks should prove interesting to that portion of the public still too naive to think that Ma Bell is as benevolent and Simon-pure as she pretends to be!

If you are interested, can furnish you with a blow-by-blow account of his arrest and trial, including the Telco's "secret" techniques for detection, the Benlian recorder, etc. Nothing you really didn't know, but some interesting points emerged.

How about an article dealing with the infamous 1033 cycle tone? Several here are getting the "most" out of their TT phones, becoming "operators", setting up conferences, loops and other fun things with the aid of nothing but their revised TT pads. Would you like an illustrated "how-to" article?

Let me know if you are in need of Autovon accessing info.

'Green Book' currently available thru the U. N. Bookstore in N. Y. Price is quite high, even for the single volume on switching, but maybe someone with a Xerox could make this valuable info more available to those who need it. Most here have a copy of the White Book Vol. 6, and it certainly comes in handy.

Would much enjoy talking with you people sometime, what's a good number, and a good time to call? Our hats off to you all, your newsletter has a nice, alarmingly professional appearance, and we do realize the substantial effort and risks involved in its publication.

May 1975 see you prosper in a very big way.

Yours truly,  
Milo Fomili  
Seattle, Wa.

Loops (supv.) within the 206 NPA in current operation:

527-2897, 8 932-0018, 9

941-0018, 9

There are many more, but these work most of the time. Keep checking the Sears conference number (344-44XX), it may open again one day, with a little help. The BC conference (604-059-2111) may still be afd into with difficulty, but simple access from 206 NPA is thru Montreal (use 514-958-4D) to get 4-A.

Both previous numbers are non-supp.

The venerable "Voice of Chester" is alive and well on 206-641-2382 (supv.). A recorded announcement will then define the week's programs. Topics like Acupuncture, health foods, CIA, sexual customs, it's all there for the listening. Numbers given by the announcement are intended to be substituted for the 1-1-1 in the first example.

Equipment wise, there are many new CMOS designs in use in this area. They draw negligible power, combine completely automatic red and blue functions and are automatically sequenced with memory storage of several numbers. All this within a case about cigarette pack size seems incredible, but I assure you they work perfectly, and circuits are available. Incidentally, a recent article appearing in one of the leading electronics trade magazines states that soon many Telco exchanges may employ message format "discriminators" to eliminate illegal MF inputs, presumably hand keyed. The computer age is here, gentlemen -- let's make it work for us!

## Dial Tone Speed Measurement

(CONTINUED FROM PAGE 7)

one entity be assigned to one DTS Register Circuit. This is to assure operation in each unit is maintained by reducing the number of entities to one. Also, it is of particular importance where the two entities do not have equipments that are fully and mutually compatible with the DTS Register Circuit.

### LOADING DIVISIONS:

#### PAIRS OF T AND D REGISTERS

Arrangements permit a separate pair of T and D registers to be associated with each arc, for a maximum of 20 test lines. Or, more test lines can be assigned to a single pair of T and D registers by grouping, up to the entire 5 arcs on each selector switch (100 lines). This is done so that DTS may be measured separately for classes of service; for several loading divisions; for Dial Pulse and TONE-TO-ONE, etc., and allows 5 pairs of registers (5 Loading Divisions) on the 200-line unit.

Aracs are associated with a particular pair of T and D Registers by the setting of the rotary switches in the older versions and by flexible cross-connections in later versions. Recognize that there can be only one Loading Division on one arc. Therefore, when there are 5 Loading Divisions, the 200-line unit must be used even though less than 100 lines are to be tested.

Of importance is that DTS may be measured separately for each class of service, or Loading Division; that, it will be noted that the Traffic Service Observing Practice (TSOP) defines Loading Divisions and also specifies how the arcs and test lines are to be assigned from this viewpoint. Also, how the results computed and weighted are stipulated.

#### BYPASSING ARCS

Any or all arcs may be completely bypassed during a study period. This avoids the loss of tests where entire arcs do not have test lines terminated. Also, it allows testing to be concentrated on selected Loading Divisions when necessary or desirable.

The skipping of an arc is affected in the older versions by setting its associated rotary switch in position 6. In the later versions, by placing the associated toggle switch in the down position. Thus, there are 5 rotary switches or 5 toggle switches for 100-line units and 10 switches for 200-line units.

#### ACCURACY VS. TESTS PER HOUR

When done as the TSOP specifies, the weighted DTS of the entity is considered reliable, being based on between 850 and 1200 tests an hour depending which versions of the circuit is used and how the lines are assigned. It is important that all of the suggestions relating to obtaining the maximum number of tests possible, be followed as the number of tests has a direct bearing on the accuracy of the measurement as illustrated below.

When less than 850 tests are made in one hour, the reason will want to be determined. Where the tube-type timing circuit is used, this may denote the need for recalibration of timer. It may also mean improper use of skip, dwell and/or bypassing of arcs. In any event, it means an increased sampling error.

Some indication of the loss of accuracy when less than 850

tests are made in an hour is shown by the following table of Theoretical Limits of Sampling Error, for a 90% Assurance Level:

Actual % Over 3"	Probable Range of % Over 3" Number of Tests (1 Hour)			
	200	400	600	800
1.0	2.0	1.8	1.6	1.5
	.3	.4	.5	.5
1.5	2.8	2.4	2.3	2.2
	.5	.7	.8	.9
8.0	11.2	10.3	9.9	9.6
	5.1	5.9	6.2	6.5
20.0	24.9	23.4	22.8	22.4
	15.6	16.8	17.4	17.7

Consideration will want to be given to the loss of accuracy particularly when as few as 200-400 tests are made in an hour. This is of concern when the DTS results for a small Loading Division is being reviewed. For example, in a No. 1 Cross-bar Office with three Loading Divisions as below, the measured values for Party and Coin are extremely unreliable indicators of their grade of service. However, recognize that the weighted Entity value would be satisfactory since the entire 900 tests would be reflected.

Type	TIME Busy Hour	Registration			As Measured	Probable Range (Approx.)
		T	D	% Over 3"		
Ind.	10:30-11:00 AM	700	5	.7	.4	1.0
Party	7:00-8:00 PM	150	3	2.0	.9	4.0
Coin	1:30-2:30 PM	50	2	4.0	2.0	9.0
		900				

#### INCREASING ACCURACY FOR SMALL

##### LOADING DIVISIONS

Where more accurate measurements for small loading divisions are required, this can be done by "skipping" the arcs for any loading divisions for which DTS measurements are not needed at the same time. In the above illustration, it will be noted that during the Coin B.H. of 1:30-2:30 PM, the coin class would be given the entire 900 tests. And, the results would be more accurate as below (assumes 4.0% over 3" measured in both cases):

As Measured	% Over 3"		
	50 Tests	900 Tests	900 Tests
4.0	2.0 to 9.0	3.0 to 5.0	3.0 to 5.0

The improvement in accuracy is worthwhile. However, this procedure of skipping arcs is not recommended normally. This is because of the possibility of errors of setting the switches each study period causing a loss of data or the incorrect assignment of D and T Registers in the version with rotary selector switches.

The above procedure (while it does improve accuracy by reducing error due to sampling rate) in no way reduces the effects of the other three sources of measurement error listed previously.

## When the Phone Company turns a deaf ear

(Continued from page 6)

Credit rating B: Preferred customer with established credit gained by six months of service without any five-day shut-off notices. If a deposit is involved, the service rep may not upgrade an account to "B." Full two months to pay your bill. Friendly reminder (gentle aquamarine notice): "Have you forgotten your payment?" followed by five-day warning (fiery red ultimatum: "Your payment hasn't arrived!").

Credit rating C: Higher classification for new customers. Purely arbitrary whether a person is put in "C" or "D." Odds are good that if you live in a "D" rating, "C" customers get 20 days to pay and a friendly reminder before the five-day warning goes out.

Credit rating D: All other new customers. They get only the five-day warning, and this comes just 16 days after the bill was originally mailed out by the phone company.

Credit rating E: Reserved for those who have had their service disconnected for nonpayment of phone bills. Five-day shut-off notice comes a scant ten days after the bill was first mailed out.

### WHAT DO YOU DO WHEN YOU GET THE FIVE-DAY SHUTOFF NOTICE?

If you receive a five-day shut-off notice, call your service rep. The good story ready (you've been out of town, sick, etc.) and either make arrangements to pay the bill now or set a definite date when the bill will be paid. Set the date even if you can't stick to it. Giving a date shows you intend to pay and will keep your phone from being disconnected.

If you don't call, your service rep will try to reach you by phone on the sixth day after the date of the five-day notice. If there is no answer after two calls, the rep will shut off outgoing calls but still permit incoming calls. Again, call and try to make arrangements to pay. Your rep has to disconnect all service after five days of a partial disconnect, but supervisors can authorize up to 15 days. Even if you drop a check in the mail immediately, call to protect yourself in case the mail delivery is slow.

If your service is totally shut off, your rep can require you to pay the total outstanding bill, a \$24 connect charge, plus a deposit equal to the average monthly bill over the previous three months. Again, this can be waived if you scream loud enough.

One final warning: everything gets noted on your record. If your phone is disconnected, your credit rating is going to drop to a "D" or an "E." If you give excuses every month, the rep will catch on. It's best to pay on time when you can and have your late payments for real emergencies.

### HOLIDAYS FOR THE PHONE COMPANY

ARE HIGHLY SELECTIVE.

The phone company has special long distance rates for holidays that are much lower than weekdays. In the coming year, July 4, Labor Day, Thanksgiving, Christmas, New Year's and Washington's Birthday are all special-rate holidays. But not Columbus Day or Memorial Day, which are both holidays for phone company employees. Mother's Day or Father's Day, when people would be prone to make calls to their family.

### WHAT THE BILL DOESN'T TELL YOU

THAT IT SHOULD.

In mid-June, AT&T urged its member companies to include on their bills the time of day of long distance calls and the duration of the calls. Unfortunately, even though these changes are on Pacific Telephone's drafting boards, they have yet to be made. Thus, the actual lengths of your long distance calls are not noted on your bill, so there is no way you can easily check to see if you were charged for more minutes than you actually spoke. Furthermore, the time the call was made is not noted on operator-assisted calls. If there is a mysterious operator-assisted call to Lodi on your bill, you don't have the advantage of knowing when they think the phone call was made to determine who, if anyone, actually made the call.

## HOW TO GET THE MOST OUT OF YOUR TELEPHONE

ONE DOLLAR WHEN YOUR SERVICE IS CONNECTED.

The phone company is able to rack up extra profit because people take phone service for granted, and even if a person wants to get the cheapest service, he or she is not provided with the information to make an intelligent decision.

For example, when you order a phone, anything you get beyond a single-listed dial phone with a short cord is going to cost you. For example: a 25-foot cord will set you back \$7.50; a touch tone phone costs an additional \$5 to install plus \$1.60 each month; even an extra listing in the directory will cost you \$4.80 a year.

If you live alone, are new to the City or don't use the phone too much, it will pay you to get a measured service.

For \$2.50, you get 30 local calls. For \$3.75 you get 60. Unlimited service runs \$5.70. With the measured service, each local call past your allotment costs you 5¢. In other words, if you make less than 54 calls a month, it pays to get the \$2.50 service; less than 100 calls, get the \$3.75 plan. If you consistently make more calls than you thought you would, you can always switch to a different service at no extra charge, but it pays to try the limited calls alternatives.

### WHEN SAYING HELLO TO NEW YORK CITY COSTS ONLY EIGHT CENTS MORE THAN SAYING HELLO TO WALNUT CREEK.

Over the years, the gap between the expense of a long distance call made within the state or even within the Bay Area has narrowed to the point where it often has ceased to exist. For example, a one-minute call to New York City after 11 pm will only cost 35¢, while a three-minute (or shorter) call to Walnut Creek will cost 25¢ from downtown SF.

The following chart of phone charges for direct dialing from SF to New York City illustrates the cheapest times to make out-of-state calls:

Time	First Three Min.	Each Add. Min.
Sat. 8 am - 11 pm	70¢	20¢
Sun. 8 am - 5 pm		
M-F 5 pm - 11 pm	85¢	25¢
Sun. 5 pm - 11 pm		
Hol. 8 am - 11 pm		
M-F 8 am - 5 pm	1.45	46¢
M-F 11 pm - 8 am	35¢*	20¢
Sat., Sun., Hol.		

\* First Minute

### HOW TO GET RESULTS IF YOUR SERVICE REPRESENTATIVE TURNS A DEAF EAR.

The phone company has very set procedures but often can be made to grant exceptions if you complain clearly, loudly, and persistently. Each time your demand gets turned down, ask to speak to a superior. The higher you go, the more likely the person is to say "yes" or listen sympathetically. Above the service rep is the supervisor, then comes the manager.

If necessary, ask for the district manager, then the division manager. Ask for a personal interview, write letters with carbons. If you are still not heard, ask for the president, Jerome Hull. After you talk to him, ask for his secretary, your last resort is to complain to the California Public Utilities Commission. (In SF it's 557-0350). Send carbons all around.

Make threats all up the ladder: state that monopolies like Pacific Telephone have to give the customer satisfaction; mention the US government's antitrust suit; say you will appear in their latest rate hike request unless you get satisfaction. Remember: complain enough and you will often get results.

# COMPARISON CHART — TELEPHONE ANSWERING / RECORDING DEVICES

1 MANUFACTURER OR DISTRIBUTOR	2 MODEL NAME & NUMBER	3 SUGGESTED RETAIL PRICE \$	4 MAXIMUM OUTGOING MESSAGE (SECONDS)	5 VARIABLE LENGTH OUTGOING MESSAGE (SECONDS)	6 MAXIMUM INCOMING MESSAGE (SECONDS)	7 MAXIMUM MESSAGE (TOTAL)	8 VOICE ACTIVATED	9 AUTO LEVEL CONTROL	10 CALL RECEIVED INDICATOR	11 RECORDS PHONE CONV.	12 REMOTE CALL- BACK	13 DIMENSIONS (INCHES)		14 FEATURES & REMARKS
												WIDE	DEEP	HIGH
ACCURATE MERCHANT, INC. 400 Madison Ave. New York, N.Y. 10017 BELAITE ENTERPRISES 1500 Broadway Hawthorne, Calif. 90250 BSR TOSAI LTD. Consumer Prod. Route 303 Blauvelt, N.Y. 10913	TELE-TENDER MODEL K229	140	60	YES	45	90	0	YES	NO	YES	NO	13	9	3
	MY SECRETARY MS-1	159	20	NO	25	108	0	YES	LIGHT	NO	NO	12 1/2	10 1/4	4 1/2
	PHONE BUTLER TA-1000	100	20	NO	30	30	0	YES	LIGHT	NO	NO	9	10	2 1/2
	MARK I	160	180	YES	60	EXTERNAL RECORDER	0	EXTERNAL RECORDER	EXTERNAL	NO	NO	9	10 1/4	3 1/4
	MARK II	219	180	YES	60	60	0	NO	NO	NO	NO	14 1/4	10 1/4	3 1/4
CRAFT ELECTRONICS, INC. 830 Hempstead Turnpike Franklin Square, N.Y. 11010	MARK III	495	180	YES	2700	90	YES	YES	NO	NO	YES	14 1/4	10 1/4	3 1/4
	CTA-4100	100	120	YES	120	EXTERNAL RECORDER	0	EXTERNAL RECORDER	EXTERNAL	NO	NO	8 1/2	10 1/2	3 1/4
	CTA-4400T	240	20	NO	90	90	0	NO	TAPE COUNTER	NO	NO	10	12 3/4	3 1/4
	CTA-4450	290	23	NO	90	90	0	YES	TAPE COUNTER	YES	NO	15 1/4	11	4 1/4
	ANSAPHONE 640	325	180	YES	2700	90	YES	YES	TAPE COUNTER	NO	NO	8 1/2	8 1/2	5
DICTAPHONE CORP. 120 Old Post Road Rye, N.Y. 10580	ANSAPHONE 650	450	120	YES	1800	60	YES	YES	TAPE COUNTER	YES	NO	10 1/2	14	4
	ANSAPHONE 590	695	180	YES	2400	80	YES	YES	TAPE COUNTER	YES	YES	12	12 1/2	4
	DORO 311	345	720	YES	3600	120	YES	YES	CALL COUNTER	YES	NO	12 1/2	11 1/2	3 1/2
	DORO 320	695	720	YES	3600	120	YES	YES	CALL COUNTER	YES	YES	12 1/2	11 1/2	3 1/2
	CODE-A-PHONE MODEL 360	200	120	YES	120	90	NO	YES	YES	NO	NO	10	12 3/4	3 1/4
FORD INDUSTRIES, INC. 5001 S.E. Johnson Creek Bl. Portland, Ore. 97206	CODE-A-PHONE MODEL 525	425	18	NO	900	30	YES	YES	YES	NO	NO	14	11	5
	CODE-A-PHONE MODEL 444	650	18	NO	1200	45	YES	YES	NO	NO	YES	14 1/4	9	4 1/2
	CODE-A-PHONE MODEL 560	795	18	NO	1800	60	YES	YES	YES	NO	YES	14	12	5
	CODE-A-PHONE MODEL 700	895	180	YES	7200	120	YES	YES	YES	NO	NO	11 1/2	14	4 1/4
	CODE-A-PHONE MODEL 800	995	180	YES	7200	120	YES	YES	YES	NO	NO	13	14	5
PHONE-MATE, INC. 335 Maple Ave. Torrance, Ca. 90503	PHONE-MATE 400	140	30	NO	30	20	NO	N/S	FLAG	NO	NO	9 1/2	12	3 1/2
	PHONE-MATE 800	170	30	NO	30	20	NO	N/S	FLAG	NO	NO	9 1/2	12	3 1/2
	REMOTE- MATE	130	30	NO	30	8 PER CALL-BACK	NO	N/S	FLAG	NO	YES	9 1/2	12	2 1/2
	SANYO ANSWER MAN	259	120	YES	120	90	NO	YES	NO	NO	NO	10	12 3/4	3 1/4
	XL-700	99	N/S	NO	N/S	60	NO	YES	NO	YES	NO	13	10 1/2	3 1/4
ROBINSON/OHMURA 1366 Ninth Ave. San Francisco, Ca. 94122 STENO-PHONE CORP. 1561 Hempstead Turnpike Elmont, N.Y. 11003	PHONE-MATE 400	140	30	NO	30	20	NO	N/S	FLAG	NO	NO	9 1/2	12	3 1/2
	PHONE-MATE 800	170	30	NO	30	20	NO	N/S	FLAG	NO	NO	9 1/2	12	3 1/2
	REMOTE- MATE	130	30	NO	30	8 PER CALL-BACK	NO	N/S	FLAG	NO	YES	9 1/2	12	2 1/2
	SANYO ANSWER MAN	259	120	YES	120	90	NO	YES	NO	NO	NO	10	12 3/4	3 1/4
	XL-700	99	N/S	NO	N/S	60	NO	YES	NO	YES	NO	13	10 1/2	3 1/4

EXCEPT AS NOTED, ALL UNITS: RECORD INCOMING MESSAGES; MONITOR THROUGH SPEAKER OR EARPHONE; MONITOR CAN BE SILENCED; OPERATE ON 117 VOLTS AC; PLUG DIRECTLY INTO PHONE JACK;

N/A — Not Applicable.  
N/S — Information Not Supplied.  
A — Records & Plays on Standard Cassettes.  
B — Can Be Used for Dictation.  
C — Earphone Used for Private Listening.  
D — Allows Group Listening to Calls.  
E — Incoming Message Length Fixed.  
F — Family Message Center Included.  
G — Fast Forward N/S.  
H — Plays Standard Cassettes.  
I — End of Tape Disconnect.  
J — Outgoing Message can be Changed by L, Fast Rewind N/S.

Remove Call-Back Unit.  
K — Accumulated Messages Can be Erased by Remote Call-Back Unit.  
L — Fast Rewind N/S.

M — No Fast Forward.  
N — Battery-Powered.  
O — External Recorder for Additional Messages.  
P — Monitor Always On.  
R — Monitor N/S.



